

## Applicable Products: AC4, AC4-CS, Master3-1, DC4-MCS

### Introduction:

This manual describes the programming procedures for the Compact Custom™ family of motor controllers from RS Scene Automation. The intended audience is home automation installers and programmers.

### Programming:

The AC4, AC4-CS, and DC4-MCS have four output terminal blocks that each connect to a motor through a four wire interface. These terminal blocks are labeled Motor 1 through Motor 4 as shown in Figure 1 and Figure 2 with the component side of the board facing up. On the Master3-1, Motor1 is connected directly to the board. If the nine terminal expansion port on the Master3-1 is facing to the right then the Motor expansion ports 2-4 are defined from bottom to top. Note that these can be programmed in a similar fashion to the AC4.

The AC4, AC4-CS, and DC4-MCS also have a contact closure interface. Contact closure provides the option of controlling motors from a pair of momentary switches wired directly to the control unit. There are four contact closure inputs labeled switch1 - switch4.

The contact closure connector is a 12 conductor header that mates to four 3 conductor plug-in terminal jacks. The 12 conductor header is on the left side of the board. See the figure on the following page. The three conductors on each terminal jack are open, DC Ground, and close. Each of the jacks accepts inputs from a pair of momentary contact switches. These switches will act identically to the button pairs on an IR remote. The center terminal of each of the terminal jacks is connected to DC ground. The switch pairs are used to activate either an Open or Close command by momentarily shorting either the open or the close inputs to DC ground. If the open, close and ground terminals are all momentarily shorted together then an ALL STOP command is sent.

## ENTERING PROGRAMMING MODE

RS Scene Automation offers two devices that may be used for programming of Compact Custom™ motor controllers:

- KPR-24 (24 channel keypad programmer)
- B232-8 (RS232 bridge)

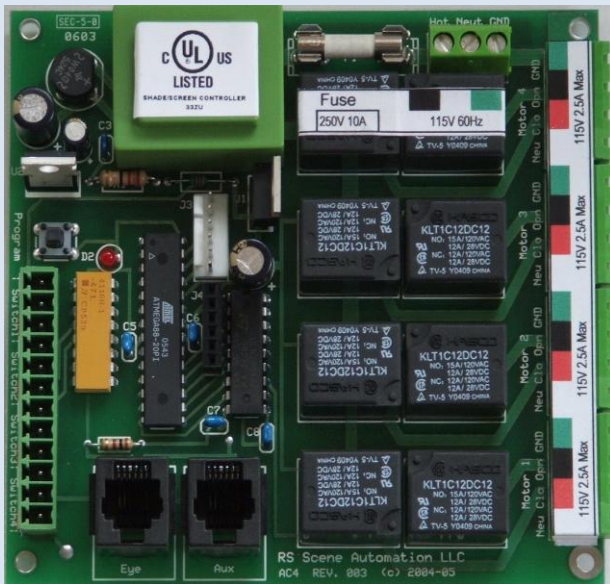
Specific syntax for using the B232-8 is covered in the user documents available online at:  
<http://www.lagotek.com>

Programming may also be performed using Electronics Solutions, Inc. 12 or 24 channel input devices (IR remote, RF remote or keypad). These devices must specifically mention that they work as programming devices. In general, remotes and keypads must have at least 7 button pairs, referred to as channels, and a stop button to work as a programmer.

Programming using an IR remote requires that an IR eye is plugged into the Eye jack of the target control board and that the remote is pointed at the eye. Programming with an RF remote requires that an RF receiver is plugged into the Eye jack and that the receiver is within range. The keypad, if used, must be plugged into the target control board.

Enter programming mode by holding down the stop button and then pushing both OPEN7 and CLOSE7 simultaneously. All three buttons must be held simultaneously for a brief period.

Program mode may also be initiated by momentarily pushing the program button (AC4, AC4-CS and DC4-MCS only). The advantage of using the program button in multiple board installations is that it only initiates programming on the specific board whose button was pushed. If a keypad or remote is used for programming, the control bus wiring must be disconnected to avoid programming of other boards.


**Figure 1: AC4**

**Figure 2: DC4-MCS**

## PROGRAMMING MOTOR ASSIGNMENTS

Compact Custom™ control units are shipped with Motor 1 controlled by channel one, Motor 2 by channel two, Motor 3 by channel three, and Motor 4 by channel four. Programming allows these assignments to be changed. In order to activate a motor, at least one channel must be assigned to it.

Each motor can be assigned up to six different channels (A maximum of three channels per motor can be assigned on the Master3-1). This allows for motors to be controlled individually and as part of a group. In some cases it may be preferable to have a motor be part of multiple different groups as well as individually controlled.

Identify which of the four output terminals (which motor number) is to be programmed. Determine which channels (button pairs) should be assigned to operate a particular motor. The table below is provided for this purpose as a convenience. A graphical system example is also provided later in this document.

Motor	Channel	Channel	Channel	Channel	Channel	Channel
1						
2						
3						
4						

**Step One:**

Enter Programming mode as described above.

**Step Two:**

Select the motor to be programmed by pressing the OPEN n button, where n is the motor number. Note that only OPEN1 through OPEN4 are functional since the controllers only control up to four motors. When the unit receives a correct motor entry, the selected motor will activate briefly in each direction, followed by the LED illuminating. Do not proceed to Step Three until the LED is illuminated, indicating the programming mode for the selected motor is active and ready to receive commands.

**Step Three:**

Press the channel numbers one at a time that are to be assigned to this motor, for example OPEN1 then OPEN4 will assign channels 1 and 4 to the motor. Up to three channels can be assigned to a single motor on the Master3-1. Up to six can be assigned on the AC4, AC4-CS, and DC4. Either the OPEN n or CLOSE n buttons will work for this step.

*To erase all programming for a motor, simply skip step three.*

**Step Four:**

Press STOP to exit programming mode. Begin again with Step One to program another motor. Note that STOP *must* be pressed to complete the programming for a motor. With this programming method, motors are programmed individually and it is necessary to reenter programming mode for each motor. The LED will turn off when programming mode is exited.

**PROGRAMMING THE CONTACT CLOSURE INTERFACE**

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This section does not apply to the Master3-1.

The contact closure inputs are labeled switch1, switch2, switch3 and switch4. These switches are associated with only one channel. The default programming has switch 1 assigned to channel 1, switch 2 assigned to channel 2, switch 3 assigned to channel 3, and switch 4 assigned to channel 4. With the channel/motor defaults listed above, this means that from the factory, switch 1 will control motor 1, and so on.

Programming the switch assignments will allow a switch to function as if it were a button on the remote. For example, if the OPEN 7 button is programmed to activate motors 1, 3, and 4, then associating Switch 2 with channel 7 will allow switch 2 to also activate motors 1, 3, and 4.

Each contact closure can be assigned to any channel from 1-24.

Identify which channel is to correspond to each of the four contact closure inputs. A table is provided below for convenience.

Switch	Channel
1	
2	
3	
4	

**Step One:**

Enter Programming mode as described above.

**Step Two:**

Select the switch to be programmed by pressing the CLOSE n button, where n is the switch input number. Note that only CLOSE1 through CLOSE4 are functional since the controllers only have four switch inputs. When the unit receives a switch input entry the LED will illuminate.

*To erase any Switch's association with a channel, press STOP at this point.*

**Step Three:**

Press the channel number to which the switch input will be assigned, for example CLOSE5 will assign channel 5. Only one channel can be assigned to each contact closure input. The LED will no longer be illuminated indicating that the command has been accepted and that programming mode has been exited. For the next switch, begin again at Step One.

**CONTACT CLOSURE GLOBAL MODE**

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In situations where multiple motor control boards are used, there may be the need to control several motors which are each connected to different control boards, using the contact closure interface. For example, assume a switch is connected to an AC4 called "Controller 1". Controller 1 is connected to a motor which needs to be controlled by pressing the switch. However two other motors are connected to an AC4-CS called "Controller 2". If the switch is pressed, the factory default is set such that the switch can only control motors on Controller 1.

If we want the switch to *also* control motors on Controller 2, the contact closure system must be set to global mode. To do this with an IR remote, enter programming mode as described above, then briefly press Open 5 followed by Close 1.

## CALIBRATION AND INTERMEDIATE STOPS

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The AC4-CS and DC4-MCS must be calibrated after channels are assigned to motors. During calibration, these boards measure the time necessary for each of the motors to reach full travel. It is assumed that this will be no longer than 60 seconds. The calibration data is used to precisely position the motors when the intermediate stop feature is activated.

To calibrate the AC4-CS or DC4-MCS, enter programming mode as described above, then briefly press Open 5 followed by Close 5. The unit will exit programming mode automatically when calibration is complete.

By default there are three intermediate stop positions available after calibration. These positions are 25%, 50% and 75% open. Each of these positions may be assigned to a channel by entering programming as previously described, then press Close 5 followed by Open# (#=channel to be assigned) and then Open1(25%), Open2(50%) or Open3(75%). Note that once programming has been completed the position may be selected by either pushing Open or Close for that channel. If positions other than the default are desired proceed with custom intermediate stop programming.

To program custom intermediate stops, first position the four shades, enter programming mode, then briefly press: Open5, then Open1 to calibrate all motors for the first intermediate stop. Reposition the four shades, enter programming then press Open5, then Open2 to calibrate all motors for the second intermediate stop. Reposition the shades again as desired, enter programming, press Open5, then Open3 to calibrate all motors for the third custom intermediate stop.

## RESET TO FACTORY DEFAULTS

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To reset the controller to factory defaults (AC4, DC4-MCS and AC4-CS only), enter programming mode as described above, then briefly press Open 5 followed by Open 5 again. The unit will exit programming mode automatically when the reset is complete.